UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HOLGER NOLTE, CAMILLA HORST,
MARC HOFFMAN and WERNER POSCH

Appeal 2007-0563
Application 10/001,940[1]
Technology Center 2100

Decided: May 22, 2007

Before: JAMESON LEE, SALLY GARDNER LANE, and
SALLY C. MEDLEY, *Administrative Patent Judges*.

MEDLEY, *Administrative Patent Judge*.

DECISION ON APPEAL

A. Statement of the Case

Applicants appeal under 35 U.S.C. § 134 from a final rejection of claims 1-38. We have jurisdiction under 35 U.S.C. § 6(b).

The prior art relied upon by the Examiner in rejecting the claims on appeal is:

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1 Application for patent filed 29 November 2001. The real party in interest

Montgomery	US 5,696,533	Dec. 9, 1997
Iwamura	US 5,945,976	Aug. 31, 1999

Claims 1-38 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Iwamura in view of Montgomery (Final Rejection 3 and Answer 3).

B. Issue

There are two issues before us as follows:

1) The first issue is has the Examiner failed to sufficiently demonstrate that either Iwamura or Montgomery teaches "a color value stored for each pixel in the display device" or "stored a respective color value for each pixel in the display device" as required by claims 1-10 or claim 37 respectfully?

2) For all other independent claims (and those claims that depend on the other independent claims), has the Examiner failed to sufficiently demonstrate that there is a legal basis for combining Iwamura and Montgomery?

For the reasons that follow, the Examiner has failed to sufficiently demonstrate that there is a legal basis for rejecting claim 1 (also dependent claims 2-10) and claim 37 based on the combination of Iwamura and Montgomery, but has sufficiently demonstrated that there is a legal basis for combining Iwamura and Montgomery for all other involved claims.

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is Critical Reach, Inc.

C. Findings of fact ("FF")

The record supports the following findings of fact as well as any other findings of fact set forth in this opinion by at least a preponderance of the evidence.

1. Applicants' claims 1-38 are the subject of this appeal.

2. The Examiner finally rejected claims 1-38 based on the combination of Iwamura and Montgomery.

3. There are eleven independent claims involved in the appeal.

4. Applicants argue all of the claims 1-38 together as a group (Br. 11).

5. Independent claims 1, 11, 33 and 37 are reproduced as follows:

1. A graphical user interface comprising:

a rendered image of at least one graphical object, wherein the graphical object uses a number of pixels on a display device;

a color value stored for each pixel in the display device; and

object identification data stored with each pixel covered by the rendered image, wherein the object identification data uniquely identifies the graphical object located at the pixel.

11. A method for providing information to a program using a graphical user interface, the method comprising:

rendering an image of a plurality of graphical objects at specified locations of a two-dimensional display device;

storing a color value for each location in the two-dimensional display device; and storing object identification data for each of the specified locations, wherein the object identification data uniquely identifies one of the graphical objects at the at least one location.

33. A system for displaying and interacting with graphic objects, the system comprising:

a display device comprising a plurality of pixels arranged in a two-dimensional array, wherein graphical objects may be associated with any of the plurality of pixels;

a frame buffer having a plurality of entries where each entry is associated with one of the plurality of pixels;

object identification information corresponding to one of the graphical objects, the object identification information being stored in a frame buffer.

37. A graphical user interface comprising:

a rendered image of at least one three-dimensional graphical object, wherein the graphical object uses a number of pixels on a display device, and wherein there is stored a respective color value for each pixel in the display device; and

object identification data stored with each pixel covered by the rendered image, wherein the object identification data uniquely identifies the graphical object located at the pixel.

7. The Examiner relied on Montgomery to teach "a color value stored for each pixel in the display device," as recited in claim 1 and similarly in claim 37, and directs attention to Fig. 2 and the description of that figure in Montgomery (Final Rejection 3 and Answer 3).

8. In response to the rejection, Applicants argued that "a color value stored for each pixel in the display device" is recited in all of the independent claims and that neither reference describes this feature (Br. 12).

9. In particular, Applicants argue that "a color value stored for each pixel in the display device" means that there is a separate/respective color value for each pixel in the display device and that: "not every pixel in the Montgomery device is covered by an object, only objects within the display" (Br. 13).

10. The Examiner responded and argued that:

> Iwamura's rendering is ideally-suited to carry forward into a pick-testing scheme like Montgomery's, where the pixel-by-pixel colors are then read into the color-maintaining portion of memory along with the parallel item buffer. (Emphasis by the Examiner).

And that:

> Iwamura produces a rendering of an entire scene, as bounded by a rectangular border. All points within such a display should be rendered and addressable by the pointing device. (Answer 8).

11. The Examiner argues that one of ordinary skill in the art would have been motivated to provide the Iwamura user with a direct indexing to

the identities of the contents of the scene image, whereby the indication cursor, when pointed to an Iwamura object, will return object identification from the pre-stored Montgomery item buffer contents at that pointed to location (Final Rejection 4 and Answer 4).

12. The Examiner also argued that motivation to provide item buffering in a three-dimensional graphics environment is explicitly described in Montgomery (Answer 4 and 9).

13. Applicants argued that even if the combination describes all of the claimed elements, that there is no motivation to combine Iwamura with Montgomery (Br. 14).

14. Specifically, Applicants argue that the motivation provided by the Examiner is legally flawed, since it is not found in the references of record (Br. 14).

15. Applicants also argue that the z-buffering system used by Iwamura (stated as being described at e.g., col. 8, l. 53) is not compatible with, nor would Iwamura benefit from, the Montgomery system using an item buffer (Br. 14 and 17-18).

Iwamura

16. Iwamura describes a graphic data processing system in which a three-dimensional scene image is generated and displayed from a map (Abstract).

17. Iwamura describes using an indication cursor to select an object within a scene (Iwamura, col. 3, ll. 23-28).

18. The full passage which Applicants direct us to for the proposition that Iwamura uses a z-buffering system is as follows:

> Though the ground object data can be obtained by a Z buffer method in computer graphics, it can also be detected by the map data as the basic data for scene display. (Iwamura, col. 8, ll. 52-55).

Montgomery

19. Montgomery describes the known prior art as follows:

> To perform the selection, or picking, operation, prior art systems traverse the entire list of graphics objects whenever the selection button on the mouse is pressed. As each graphics object is rendered during this traversal, i.e. the graphics object is constructed to be placed on the screen, the location of the pointer on the screen is compared to the location of each pixel of the graphics object, and if a match occurs, the graphics object is considered to be selected. This method is slow, however, since every graphics object up to the selected graphics object must be rendered even though only the last one is being selected. Thus, prior art methods have a performance proportional to the number of graphics objects in the display list and their performance is roughly equal to the time to display the entire graphics image or scene. (Montgomery, col. 1, ll. 46-60).

20. Montgomery further describes as prior art, a 3-D system that uses item buffering as follows:

> The concept of item buffers and picking is disclosed in "Direct WYSIWYG Painting and Texturing on 3D Shapes", Hanrahan, et al., *Computer Graphics*, Volume 24, number 4, August 1990, p. 218. This article discloses the general concept of item buffers, but provides no detail on how to implement an item buffer. (Montgomery, col. 2, ll. 6-11).

21. Montgomery explains the desire to improve performance in the method of picking a graphics object.

22. Montgomery describes a method for a system that uses a buffer to determine which graphic object has been selected by a user (Abstract).

23. For each pixel location in each of the graphic objects, a unique identifier is stored at a corresponding location in the buffer (*Id.*).

24. A graphics object is selected using a pointer device, and the pointer device location is used to access the item buffer and retrieve the item identifier that defines the graphic object picked (*Id.*).

25. Montgomery explains in more detail its system as follows:

> FIG. 2 shows an illustration of graphic objects displayed within a buffer. Referring now to FIG. 2, a computer graphics display list 202 contains two graphics objects 204 and 206. Graphics object 204 has been assigned an item identifier, which is a number 1, the Graphics Object has a rectangle shape, and it will be displayed using color number 5. Graphics object 206 has been assigned item number 2, the Object has a triangle shape, and it will be displayed using color number 9. Alternatively, the relative number of the graphics object, from the beginning of the list, could be used as the item number, thus avoiding storing the item number in the list.
>
> Frame buffer 210 shows how these two graphic images would be rendered onto a display device, such as the graphics display 108 (FIG. 1). Since the triangle graphics object 206 is second in the list, it was rendered after the rectangle graphics object, therefore, the triangle overlays the rectangle at the points where they intersect. Item buffer 208 shows how item numbers for these two graphics objects are stored in the item buffer. At each

> pixel location of the rectangle graphics object, item number 1 is stored in the item buffer, and at each pixel location of the triangle graphics object 206, item number 2 is stored in the item buffer. Since the triangle is created last, item number 2 is stored at all intersecting points of the triangle and rectangle. If a user places the pointer device cursor over pixel location 214 and presses a selection button, the system references corresponding location 212 in item buffer 208 and retrieves item number 1, thus, immediately indicating that the user has picked the rectangle graphics object. (Montgomery, col. 3, l. 64-col. 4, ll. 1-26).

D. Principles of Law

Applicants bear the burden to show that the Examiner has failed to sufficiently demonstrate that there is a legal basis for combining Iwamura and Montgomery. The obviousness determination is based on considering (1) the scope and content of the prior art; (2) the differences between the claimed invention and the prior art; (3) the level of ordinary skill in the art; and (4) any objective evidence of unobviousness, *Graham v. John Deere Co.*, 383 U.S. 1, 17, 148 USPQ 459, 467 (1966).

The Supreme Court in *KSR International Co. v. Teleflex Inc.*, 127 S. Ct. 1727, 82 USPQ2d 1385 (2007) has cautioned against applying rigid rules when considering obviousness, rules that would deny fact finders recourse to common sense. For example, the Court cautioned against applying a rigid testing, motivation or suggestion inquiry as follows:

> The obviousness analysis cannot be confined by a formalistic conception of the words teaching, suggestion, and motivation, or by overemphasis on the importance of published articles and the

> explicit content of issued patents. The diversity of inventive pursuits and of modern technology counsels against limiting the analysis in this way. In many fields it may be that there is little discussion of obvious techniques or combinations, and it often may be the case that market demand, rather than scientific literature, will drive design trends. Granting patent protection to advances that would occur in the ordinary course without real innovation retards progress and may, in the case of patents combining previously known elements, deprive prior inventions of their value or utility. *Id.* at 1396.

E. Analysis

Claim 1 recites "a color value stored for each pixel in the display device." The Examiner has failed to sufficiently rebut Applicants' argument that neither Iwamura nor Montgomery describe "a color value stored for each pixel in the display device." We agree with Applicants that the Examiner is improperly relying on Montgomery's description of a color value stored for each pixel *of an object* within a display device (FF 25) as meeting the limitation. However, storing a color value for an object, which object is within a display device, is not the same thing as storing a color value for each pixel in a display device. The language "each pixel in the display device" means pixels in the entire display device, not just those pixels that make up an object. The object(s) described by Montgomery have not been shown to cover the entire display device, but are understood to cover only particular areas of the display device.

The Examiner's argument that all points within the Iwamura display *should be* rendered and addressable by the pointing device does not mean

that a color value of all of the points, or pixels of the Iwamura display device are stored. Importantly, the Examiner has not demonstrated that a color value for each pixel in the Iwamura display device is necessarily stored for rendering or retrieval purposes.

For these reasons, we cannot sustain the rejection of independent claim 1 or claims 2-10 which depend either directly or indirectly from claim 1. Independent claim 37 includes similar language of storing "a respective color value for each pixel in the display device." For the same reason, the Examiner has failed to sufficiently demonstrate that either Iwamura or Montgomery describe storing a color value for each pixel in the display device. Accordingly, we will not sustain the rejection of claim 37.

Applicants argue claims 1-38 as a group. In the brief, Applicants state that all of the independent claims similarly recite "a color value stored for each pixel in the display device" (FF 8). That statement is inaccurate. Only independent claims 1 and 37 recite such language. While independent claims 11 and 22 recite storing a color value for *each location[of an object] in a two-dimensional* display device, Applicants have failed to address why Montgomery, which Applicants acknowledge does store a color value for each object, fails to meet the limitation in independent claims 11 and 22. Moreover, none of the other independent claims recite storing a color value at all. Therefore, Applicants' arguments that neither Iwamura nor Montgomery teach a color value stored for each pixel in the display device is not persuasive with respect to claims 11-36 and 38.

The rest of Applicants' arguments are with respect to the combination of Iwamura and Montgomery. Applicants argue that 1) there is no motivation to combine Iwamura with Montgomery and that 2) the z-buffering method used in Iwamura is not compatible with the item buffering method of Montgomery (FF 13-15).

Applicants argue that the Examiner has provided no basis, e.g., no teaching, suggestion, or motivation (TSM) cited in either Montgomery or Iwamura to combine their teachings. The Supreme Court, in *KSR* cautioned against applying the TSM test as a rigid rule limiting the obviousness inquiry (Id.). A flexible approach should be taken.

In any event, here the Examiner did provide stated reasons for combining (FFs 11 and 12) and those statements are supported by the prior art of record. One of ordinary skill at the time of the invention, recognized the problem associated with traversing an entire list of graphic objects in response to a pick. The process is slow and inefficient, especially when the list contains many objects. One of ordinary skill in the art knew at the time of the invention that item buffering may be used to solve the traversing problem in both two dimensional and three dimensional systems (FFs 19-25). The record sufficiently supports the Examiner's reasoning for combining Iwamura and Montgomery, and Applicants have failed to sufficiently demonstrate a flaw in that reasoning.

Applicants' arguments that (1) Iwamura's z buffering method is incompatible with Montgomery's item buffering, and (2) that it would make

no sense to replace Iwamura's superior z buffering method with Montgomery's item buffering method are not persuasive. The fundamental problem with Applicants' arguments is that Applicants have failed to sufficiently demonstrate that Iwamura only contemplates graphic rendering using z buffering, or forecloses using any other type of buffering. A text search of "Z buffer" or "Z buffering" revealed only one reference in Iwamura to z buffering. That same passage is the one that the Applicants rely upon in support of their argument that Iwamura only contemplates Z buffering. That passage does not facially limit the Iwamura system in any way. Iwamura states that the ground object data *can be* obtained by a z buffer method in computer graphics, but that it can also be detected by the map data (FF 18). Applicants' argument that that passage supports its assertion that Iwamura only contemplates using z buffering is not persuasive. Such an argument is conclusory and inconsistent with the plain meaning of the passage. Based on the record and contrary to Applicants' arguments, the passage does not indicate that the only method contemplated by Iwamura for rendering graphical objects is through z buffering. Applicants' argument that Montgomery's item buffering is not compatible with Iwamura's z buffering is based on Applicants' unsupported assumption that Iwamura only contemplates z buffering. Accordingly, Applicants' arguments regarding the incompatibility of Iwamura z buffering with Montgomery's item buffering is without merit.

Likewise, Applicants' argument that Montgomery's item buffer cannot be used for Iwamura's three-dimensional scene is not persuasive. As pointed out by the Examiner, and supported by the record, one of ordinary skill in the art knew how to use item buffering for pick handling in a three dimensional environment (FF 12). The Applicants are silent with respect to the Examiner's findings in that respect and have therefore failed to demonstrate that the Examiner's findings are erroneous.

Applicants urge the Board to consider additional evidence obtained from two separate web sites regarding z-buffering (Br. "EVIDENCE APPENDIX"). The evidence is in the form of two printout copies from two different websites. Both copies are dated "4/3/2006." That date is subsequent to the 29 November 2001 filing date of the involved application by over four years. Yet, the Applicants are silent as to whether the information was known to one of ordinary skill in the art at the time of the invention. For this reason, we give no weight to the additional evidence. In any event, the additional evidence does not help the Applicants. The Applicants have failed to sufficiently demonstrate that Iwamura only contemplates z buffering or that one of ordinary skill in the art would not know how to use item buffering for three dimensional graphics as already explained. For reasons already articulated, Applicants arguments are not persuasive and the additional evidence does not alter that view.

For these reasons, we sustain the Examiner's rejection of claims 11-36 and 38.

E. Decision

Upon consideration of the record, and for the reasons given, the Examiner's rejections are affirmed-in-part.

The Examiner's rejection of claims 1-10 and 37 under 35 U.S.C. § 103(a) as being unpatentable over Iwamura in view of Montgomery is reversed.

The Examiner's rejection of claims 11-36 and 38 under 35 U.S.C. § 103(a) as being unpatentable over Iwamura in view of Montgomery is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a).

AFFIRMED-IN-PART

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